



Weekly Summary Report

USEPA Oversight, Sauget Area 2, Sauget, IL

WA No. 224-RXBF-05XX / Contract No. 68-W6-0025

Week Ending Friday December 12, 2003

This report summarizes the Remedial Action (RA) work conducted by Solutia and its contractors from December 6, 2003 through December 12, 2003. The current RA fieldwork consists of barrier wall trenching, pretrenching, backfilling, and site preparation.

Contractors Onsite

Advent Environmental (stormwater treatment consultant to Solutia)
Inquip Associates Inc. (barrier wall construction contractor)
Layne-Western Drilling (drilling contractor, subcontracted to Strata Services)
Lowry Electric (electrical contractor to Solutia)
Pangea Group (construction support services, primary subcontractor to Inquip)
PSI (Professional Service Industries) (geotechnical testing services, subcontractor to Inquip)
RockHill Mechanical (pipefitter contractor to Solutia)
Strata Services (pressure grouting contractor to Solutia)
URS (primary consultant for Solutia)
Zahner Survey (surveying contractor to Inquip)

Work Performed This Week

Groundwater Migration Control System (GMCS)

The Groundwater Migration Control pumping system program was adjusted during the week by URS, under the direction of Solutia. Reprogramming this week was performed to fine tune the method that the pumping system responds to changes in the river and piezometer water levels. Adjustments were made this week to change the pump rate every 2 hours if necessary (previously it was every 4 hours) and the flow rate by a percentage calculated by an exponential formula based on the current flow rate (instead of a set 10% increase or decrease), and to allow adjustments to the flow rate based on the water level of only one piezometer being at a greater than ½-foot difference to the river stage (previously the average water level of the two closest piezometers was used by the control program).

On December 5, 2003, the pumping flow rate was approximately 1,584 gallons per minute (gpm) (or 528 gpm per extraction well), with a river stage of 381 feet above mean sea level (amsl). The flow rates fluctuated, with a general increasing trend, from December 5 through December 9. Thereafter, the extraction wells started a steady decline in pumping flow rate as the river level correspondingly rose, (river elevation rose over 10 feet during the week). The cumulative flow rate @15:00 PM on December 12, 2003 was approximately 676 gpm (or between 186 and 276 gpm at the individual extraction wells). The gradient between the river level and the water levels at the four piezometers was maintained approximately at one foot until December 10. During the last days of the week, the river elevation increased to

between 2 and 7 feet higher than the piezometers onsite. Table 1 shows the river and piezometer water elevations on December 12, at 1500 PM.

Table 1
River and Piezometer Water Elevations – December 12, 2003 (@1500 PM)

	Elevation (ft above mean sea level)
River Level	391.2
Piezometer 1S (northern-most Pz)	385.1
Piezometer 2E	384.5
Piezometer 3E	383.9
Piezometer 4E (southern-most Pz)	385.2

Night Work

Inquip continued to work 24 hours per day at the site this week (Monday through Friday). Night work this week consisted of one hydraulic clam shell rig operating in the slurry wall trench and the mechanical clam shell rig operating in the north end of the site, near the anticipated location of the Ranney Well laterals.

Site Preparation

Pangea continued work during the week to construct the new parking lot, approximately 60 feet wide by 300 feet in length, on top of the landfill. The parking lot is located adjacent to the "observation road" directly south of the two modutanks. The parking lot will be used for employee parking when the construction of the barrier wall extends to the north end of the site. Additionally, a culvert and rock road down the side of the landfill connecting the new parking lot to the south of the "office area" was constructed by Pangea during the week.

Zahner Survey were onsite during the week to locate the barrier wall alignment in the north end of the site.

Additional insulation of pipes for slurry was installed during the week after the freezing temperatures overnight caused some valves to be frozen for the morning shift. The frozen valves were thawed using a heater as required throughout the week.

Stormwater

Stormwater that had been pumped to the north modutank during the previous week was emptied into the inlet to the permanent pipeline conveying the extracted groundwater to the American Bottoms Treatment Facility. Approximately 200,000 gallons of stormwater was sent to American Bottoms. Subsequently, the modutanks contained less than 1 foot of stormwater in each tank.

Advent Environmental and RockHill Mechanical completed the installation and pipefitting of the south modutank for the Flocculation System. The flocculation system is designed to reduce the concentration of particulate matter in the stormwater to be treated, thus reducing the frequency that the filters in the filtration skid need to be changed. The system will be turned on and tested in the coming week.

The automatic pumps for non-contact stormwater were connected during the week to 6-inch HDPE pipe to convey the water. The automatic pumps are located in the far south-west

corner on the top of the landfill. The pumps will be used to convey non-contact stormwater from outside the exclusion zone in the drainage ditch southwest of the site, across the top of the landfill to the drainage ditch southeast of the site (on the boundary of Solutia property). This was required as drainage near the exclusion zone in the south of Site R has been cut off as the barrier wall construction extends around the corner to the southern alignment of the wall. Stormwater will be pumped across the construction area to the eastern drainage ditch that continues to drain under normal conditions, into drainage paths leading to the river. One automatic pump is primary, the second pump serves as a backup.

Box Culvert

Layne Western and Strata Services were onsite December 8, 2003, placing upgradient and downgradient (of the barrier wall alignment) plugs into the box culvert. Strata Services directed the grouting on behalf of Solutia with URS oversight.

Layne Western and Strata drilled two downgradient and one upgradient grout holes into the box culvert and injected grout during the previous week. On December 8, a second upgradient grout hole was drilled. Initially the new hole was used to test the downgradient plug, by pumping water containing a dye into the box culvert. No dye was observed at the box culvert outfall at the river during the test. According to Strata Services, the results indicated a solid plug in the box culvert downgradient of the barrier wall alignment.

A sand-cement grout was subsequently placed into the new upgradient grout hole. This completed activities to place plugs upgradient and downgradient of the barrier wall alignment in the box culvert.

Ranney Well Lateral Pipe

The mechanical clamshell rig, a Liebherr 855 crane, continued work during the week to excavate primary cut panels (separated from the current barrier wall trench) in the north end of Site R. The trenching took place at approximate station 28+40, in the area of the expected location of the Ranney Well lateral pipes. Work to excavate the sixth panel in the area started on December 12. No physical evidence of the steel lateral pipes from the Ranney well has been encountered.

Slurry Mixing

Approximately 130 tons of bentonite gel was used to mix slurry this week. The slurry, when pumped from the south holding pond to the trench, was tested frequently to assess its viscosity and adjusted with a blending pump using water from the fire hydrant, as necessary. The viscosity of the slurry was measured using a Marsh funnel, with results obtained during the week generally satisfactory.

Barrier Wall Construction

Inquip has opened the trench to approximately 1580 feet in length along the barrier wall alignment, from station 27+00 towards station 12+20 (please refer to Solutia's map for locations). During the week, the backfill in the trench extended to the ground surface at station 27+50. Consequently from now on, the open length of the trench will decrease on the north (start) end of the trench and increase on the south (active) end of the trench.

In general, a small backhoe was used to excavate the first 20 feet and then the KH1266 trackhoe continued trenching up to 75 feet in depth while the clamshell rigs were used subsequently to complete the excavation down to bedrock. The KH1266 trackhoe and the

Liebherr 843 and 855 (mechanical) clam shell rigs operated throughout the week, with some maintenance required for each rig. The second crane (Liebherr 853) was back in operation with the hydraulic clamshell bucket on December 10, after only being used for chiselling since November 28, 2003.

Bentonite slurry was pumped into the trench as needed to keep the excavation open. Viscosity was measured on the slurry pumped to the trench approximately every 15 minutes and the water blend fraction was adjusted as necessary. Top and bottom trench slurry samples, together with fresh slurry samples were tested at least twice per day by PSI. The parameters tested on the slurry samples consisted of viscosity, unit weight, filtrate loss, pH, and sand content. The test results met most specifications. However, the bottom trench slurry samples exceeded the viscosity parameter on some samples, and some (both top and bottom) trench slurry samples were lower than the narrower mud density specification established for the stabilization area.

Trench depths continued to be measured once daily (AM) during the week and every 100 linear feet of trench with 20-foot spacing of measurements on either side of the backfill toe. The trench depth measurements from the morning of December 12 are shown in Table 2, depicting the weekly progress. Construction progress by December 12, 2003 is shown below. Graph 1 shows the progress of the trench in comparison to the previous week. Graph 2 shows the overall progress of the barrier wall construction.

During the week, Inquip mixed and placed into the trench approximately 1230 cubic yards of backfill material. Backfill was placed on five of five workdays during the week. The backfill consisted of spoils with the addition of either 15 percent or greater clean clay soil (16 of 41 batches), or 2 percent or greater bentonite (25 of 41 batches). Spoils were transferred from south to north within the exclusion zone to provide materials for backfill mixing. Spoils were scooped up using a trackhoe, placed into a specially modified dump truck and transported to the backfill mixing pad. A second dump truck was in operation on site throughout the week to accelerate movement of spoils to the backfill mixing pad. Backfill was mixed then "back-tracked" into the trench using a bulldozer.

The backfill was tested by PSI on site for slump, unit weight and moisture content. The unit weight of backfill placed during the week measured between 124 and 128.5 pounds per cubic foot (pcf). Slump test results were between 3.0 and 4.5 inches. All test results met the minimum requirements.

One test batch of backfill was mixed in the backfill mixing pad on December 11, but not placed into the trench. The test batch consisted of trench spoils, crushed limestone / rock tailings (from quarry), and dry bentonite. The addition of the rock tailings to the backfill mix was tested to evaluate if the gradation analysis results could be improved.

Tests on the backfill mixture to be conducted offsite included permeability and gradation. Analysis results submitted to Inquip on the backfill samples for permeability (November 13 through November 24) and gradation (November 13 through November 25) were reviewed during the week. Permeability results ranged from 8.52×10^{-9} to 1.12×10^{-8} centimeters per second (cm/sec), below the specification for permeability is 1.0×10^{-7} . Gradation results met the specifications for percent passing each of the sieve sizes on all samples.

Prior to the backfill operation, the bottom of trench was cleaned thoroughly using one of the clamshell rigs. Depth-to-bottom measurements were made every 10 linear feet of trench to ensure the bottom of the trench was at a consistent depth and on top of bedrock. These depth measurements were performed with the clamshell rig's instrumentation and confirmed

in two locations manually with the downrigger (plumbob on wire). Additionally, two samples with a clam sampler were collected by URS and PSI from the top of the placed backfill in the trench prior to adding more backfill. These backfill samples were visually checked to ensure that the trench bottom was clean and free of any sand.

On December 12, clamshell were used to excavate the southern corner of the barrier wall alignment. The southern corner is located at station 11+27 and consists of the transition from the north-south alignment of the barrier wall trench to the east-west alignment of the barrier wall along the southern end of the site. The corner will be cut with a 30-foot length of the barrier wall at a 45-degree angle, which decreases the total barrier wall length by approximately 10 feet. The construction of the corner using 45-degree angles instead of one 90-degree angle is due to safety factors in operating the clamshell rigs on an inside corner.

Table 2

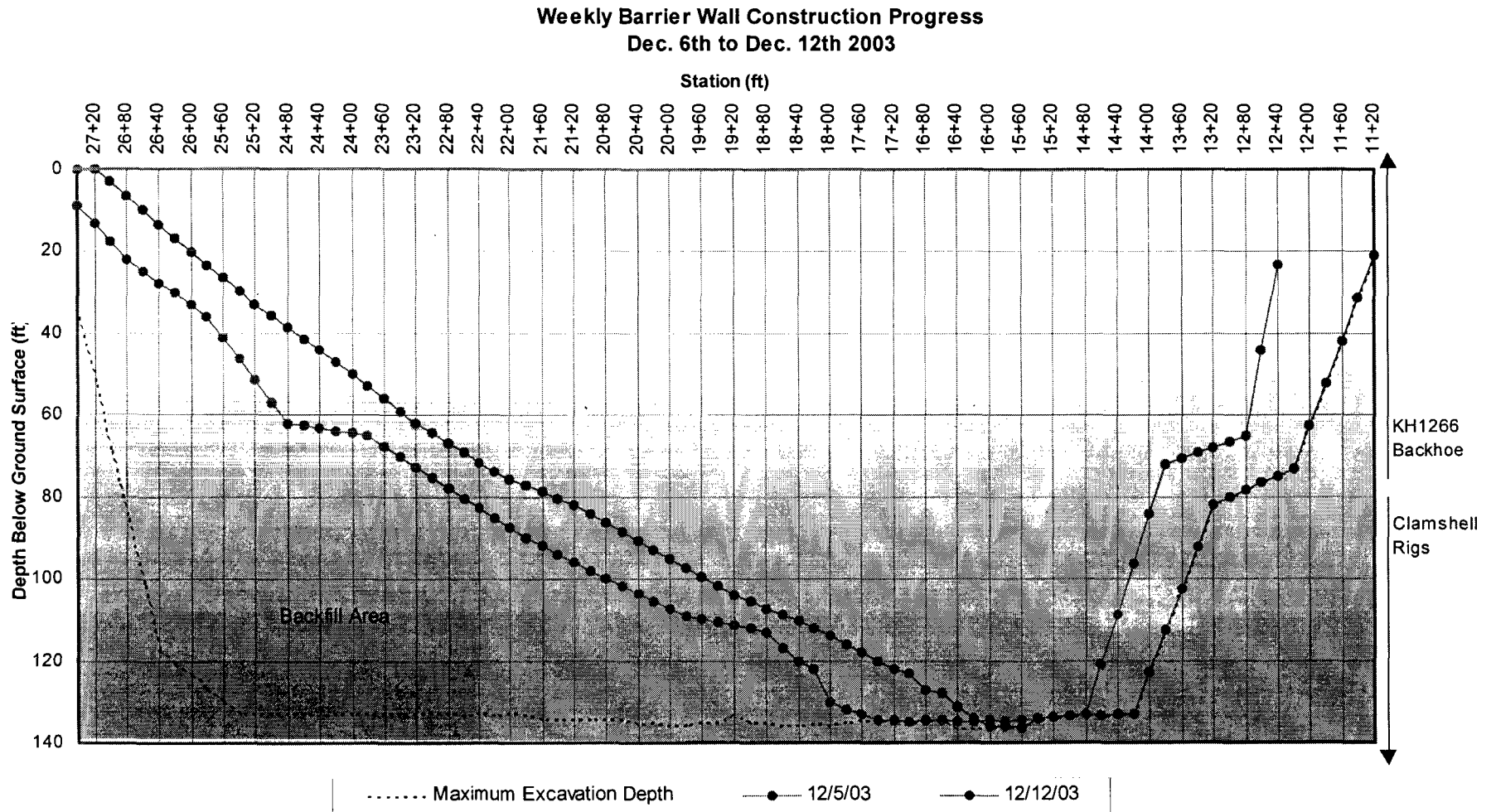
Trench Profile (Downrigger Measurements) for the Barrier Wall Trench – December 12, 2003 (AM)

Station ID	Depth to bottom (ft below ground surface)
11+20	21
12+20	73
13+20	82
14+20	133
15+20	130
15+40	130
15+60	134
15+80	134
16+00	135
16+20	134
16+40	131
16+60	128
16+80	127
17+00	123
17+20	122
18+20	112
19+20	104
20+20	93
21+20	82
22+20	74
23+20	62
24+20	47
25+20	33
26+20	17
27+00	3

Note: Distances between stations where trench depth measurements were read varies in Table 2. Measurements are separated by 100 linear feet of trench in most areas, however, the area that delineates the toe of the backfill is measured every 20 feet.

Construction Progress

Graph 1

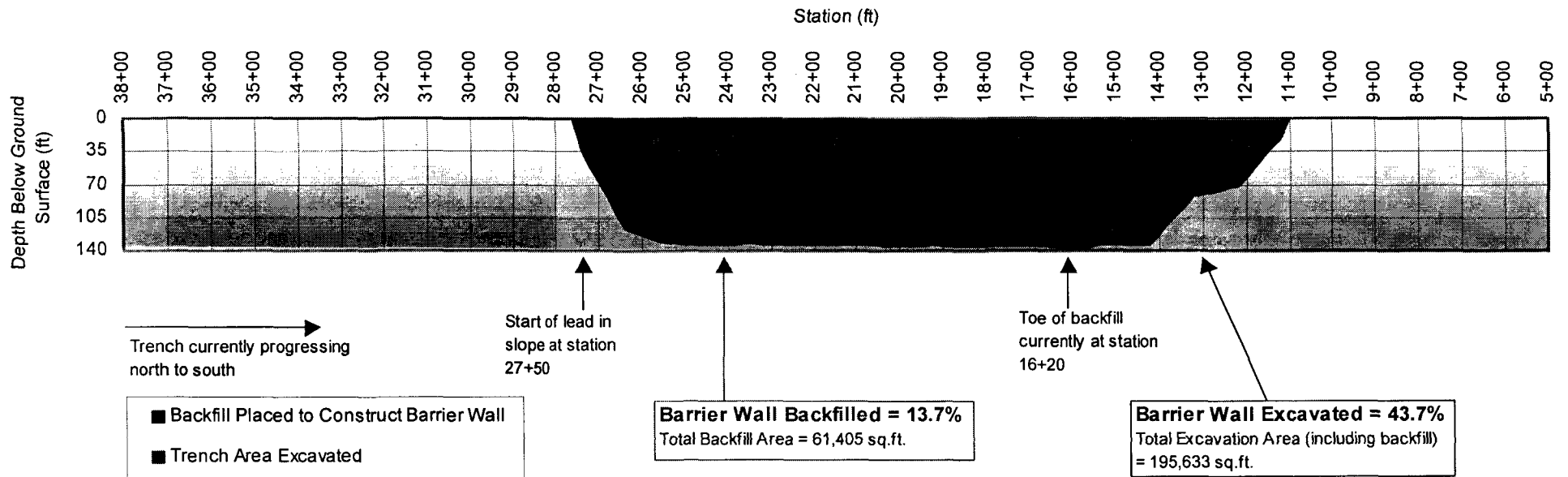


Note: Data plotted for week through AM measurements on 12-12-03.

Some data points are interpolated between the available data points where trench depth measurements were read.

Graph 2

Barrier Wall Construction Progress by December 12, 2003



Photos from week – December 8 through December 12, 2003:



Automatic pumps for non-contact stormwater were installed in the south of Site R (December 11, 2003).



Both hydraulic clamshell rigs were in operation during the week (December 12, 2003).



Installation of the flocculation system was completed during the week (December 12, 2003).